1. A method of self-calibrating and testing the vaporized flow of a liquid precursor in a thin film vaporization system comprising the steps of:

providing a thin film vaporization system comprising stored

- liquid precursors in tanks under pressure connected to a deposition chamber via a manifold which in turn is connected to pipe lines emanating from each tank and coupled to own
- , liquid flow meters (LFMs) and injection valves (IVs);

activating a servo mechanism to pump down said deposition chamber to achieve partial vacuum therein;

opening a downstream throttle valve (TV) for a carrier gas to flow through said manifold to commence self-calibration;

a first timing to monitor a baseline self-calibrated pressure by a pre-determined TV opening which correlates with the specified baseline pressure in said deposition chamber;

a second timing to allow for the stabilization of carrier gas after throttling said TV to a predetermined opening;

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selecting a liquid precursor and its own said respective pipe line with said own LFM and own IV connected to said deposition chamber via said manifold;

setting said own IV to a predetermined opening to start said liquid precursor to flow;

setting said TV opening to a normal liquid precursor flow rate for film deposition;

- a third timing to allow for liquid precursor flow to stabilize;
- a fourth timing to allow vaporization of said liquid precursor in said deposition chamber;

measuring final pressure in said deposition chamber;

stopping the flow of said precursor fluid; and

- 45 pumping down said deposition chamber to continue with said film deposition pending the result of said pressure rise.
 - 2. The method according to claim 1, wherein said tanks are pressurized by helium gas.

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3. The method according to claim 2, wherein said helium gas is pressurized to between about 20 to 30 pounds per square inch gauge (psig).

- 4. The method according to claim 1, wherein said helium gas is kept at room temperature.
- 5. The method according to claim 1, wherein said manifold has heater elements.
- 6. The method according to claim 5, wherein said heated fixture elements are spaced nominally at 290 mils between about 250 to 350 mils from distribution shower head.
- 7. The method according to claim 5, wherein said heated fixture is heated nominally to 400 $^{\circ}\text{C}$ between about 350 to 450 $^{\circ}\text{C}$.
- 8. The method according to claim 1, wherein said carrier gas is a second helium.
- 9. The method according to claim 1, wherein said flow of said second helium through said manifold is between about 750 to 850 milligrams per minute (mgm).

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10. The method according to claim 1, wherein said first timing is between about 5 to 15 seconds.

- 11. The method according to claim 1, wherein said baseline self-calibrated pressure is between about 2 to 4 torr.
- 12. The method according to claim 1, wherein said second timing is between about 4 to 6 seconds.
- 13. The method according to claim 1, wherein said liquid precursor is tetraethylorthosilicate (TEOS).
- 14. The method according to claim 1, wherein said liquid precursor is triethylborate (TEB).
- 15. The method according to claim 1, wherein said liquid precursor is triethylphosphate (TEPO).
- 16. The method according to claim 1, wherein said injection valve (IV) comprises a venturi tube.
- 17. The method according to claim 1, wherein said normal liquid precursor flow rate is between about 800 to 1000 milli gram per minute (mgm).

- 18. The method according to claim 1, wherein said third timing to allow for liquid precursor to stabilize is between about 7 to 9 seconds.
- 19. The method according to claim 1, wherein said fourth timing to allow for liquid precursor vaporized flow to be verified is between about 4 to 6 seconds.
- 20. The method according to claim 1, wherein said final pressure in said deposition chamber is between about 6.5 and 7.5 torr.
 - 21. The method according to claim 1, wherein said pumping down said deposition chamber is accomplished within between about 9 to 11 seconds.
- 22. A method of self-calibrating a thin film vaporization system and depositing thin film on a substrate placed in a deposition chamber comprising the steps of:
- providing a carrier gas and a thin film vaporization system comprising stored liquid precursors in tanks under pressure connected to a deposition chamber via a manifold which in turn is connected to pipe lines emanating from each tank and

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valves (IVs), wherein the carrier gas has its own pipe line connected to said manifold;

activating a servo mechanism to pump down said deposition chamber having disposed in it a substrate to be deposited thin film; then

allowing said carrier gas to flow into said deposition chamber via said manifold; then

measuring first pressure level in said deposition chamber to
21 establish a baseline calibration for said vaporization
system; then

- 24 allowing said liquid precursor to flow into said deposition chamber via said manifold; then
- measuring second pressure level in said deposition chamber to establish an upperline calibration for said vaporization system; and
 - performing thin film deposition in said deposition chamber using the results of said upperline calibration.

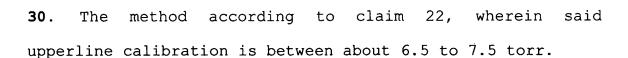
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- 23. The method according to claim 22, wherein said pump down is achieved until a partial vacuum in said deposition chamber is achieved.
- 24. The method according to claim 22, wherein said carrier gas is helium.
- 25. The method according to claim 22, wherein said carrier gas is allowed to flow at a rate between about 750 to 850 sccm.
- 26. The method according to claim 22, wherein said carrier gas is allowed to flow between about 5 to 15 seconds.
- 27. The method according to claim 22, wherein said baseline calibration is between about 2 to 4 torr.
- 28. The method according to claim 22, wherein said liquid precursor is allowed to flow at a rate between about 800 to 1000 mgm.
 - 29. The method according to claim 22, wherein said liquid precursor is allowed to flow between about 7 to 9 seconds.



31. The method according to claim 22, wherein said liquid precursor is tetraethylorthosilicate (TEOS), triethylborate (TEB), or triethylphosphate (TEPO).